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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,815	07/30/2003	Tsutomu Ohzuku	43888-267	9492

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EXAMINER	
LEE, CYNTHIA K	

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/629,815	OHZUKU ET AL.	
	Examiner	Art Unit	
	Cynthia Lee	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 14* is/are pending in the application.

4a) Of the above claim(s) *13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/1/07,7/5/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☒ Other: *IDS: 7/12/07, 10/22/07*.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/4/2007 has been entered.

Response to Amendment

This Office Action is responsive to the amendment filed on 8/3/2007. Claims 1-14 are pending. Claim 13 is withdrawn from further consideration as being drawn to a non-elected invention.

Applicant's arguments have been considered, but are not persuasive. Thus, claims 1-12 and 14 are rejected for reasons of record.

Information Disclosure Statement

The Information Disclosure Statements (IDS) filed 5/1/07, 7/5/07, 7/12/07, and 10/22/07 have been placed in the application file and the information referred to therein has been considered.

Specification

The disclosure is objected to because of the following informalities:

The Specification pg 24, last par. states that sulfate was used as an aqueous solution containing transition metal salts. Pg 24, 1st full par. states that double hydroxide or triple hydroxide was produced. However, Arguments submitted on

8/3/2007, pg 8 1st par. states that in the present invention a triple hydroxide is used as a raw material. It is unclear to the Examiner what the exact method steps are to produce the active material particles. Were the precursors hydroxides or sulfates? Did the sulfates form the hydroxides?

Pg 50, 1st full par.: It is unclear to the Examiner how the comparative examples differ from Example 1.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-12 and 14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation " uniformly dispersed at the atomic level" (emphasis added) is not supported by the disclosure as originally filed.

Applicant is required to cancel the new matter in reply to this Office Action.

Claims 1-12 and 14 1-4 and 6-8 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for $LiCo_{1/3}Ni_{1/3}Mn_{1/3}O_2$,

does not reasonably provide enablement for a positive electrode active material comprising a lithium containing composite oxide containing at least nickel and manganese elements, said positive electrode active material comprising primary particles of said composite oxide having a twining portion, the composite oxide further contains cobalt element, and the nickel, manganese, and cobalt elements are uniformly dispersed at the atomic level (claim 1), wherein said composite oxide has a layered crystal structure and the arrangement of oxygen atoms is a cubic close-packed structure (claim 2), wherein said composite oxide has a defected or disordered portion in the crystal lattice thereof (claim 3), wherein said composite oxide has a superlattice arrangement of a [sqrt 3 x sqrt 3] R30 when assigned as R3-m (claim 4), wherein said composite oxide has an integrated intensity ratio (003)/(004) of the X-ray diffraction peak when assigned as R3-m which satisfies the equation: (003)/(104)$\leq$ 1.2 (claim 6), wherein said composite oxide has an extra spot or streak substantially in every electron beam diffraction pattern indexed when assigned as R3-m (claim 7), wherein said primary particles have at least one of spherical and rectangular parallelepiped hexahedron shapes (claim 8).

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

The claimed invention encompasses compounds that are outside the scope of the one working example and disclosure. Not only are the claims broad, it appears that the amount of direction, the number of working examples, and the breadth of claims are

not commensurate in scope with the disclosure as originally filed. Hence undue experimentation would be required to determine what other compounds other than those disclosed by applicant can be used to make and practice applicant's invention as claimed.

With respect to enablement commensurate in scope with the claims, section 2164.08 of the MPEP states:

> "The Federal Circuit has repeatedly held that 'the specification must teach those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation'. In re Wright, 999 F.2d 1557, 1561, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993)... The determination of the propriety of a rejection based upon the scope of a claim relative to the scope of the enablement involves two stages of inquiry. The first is to determine how broad the claim is with respect to the disclosure. The entire claim must be considered. The second inquiry is to determine if one skilled in the art is enabled to make and use the entire scope of the claimed invention without undue experimentation."

Factors to be considered when determining whether the claimed invention would require undue experimentation are given in MPEP 2164.01 (a). In re Wands, 858 F. 2d 731, 737; 8 USPQ 2d 1400, 1404 (Fed. Cir. 1988). Only the relevant factors will be addressed for determining undue experimentation of the presently claimed invention. The relevant factors are (A) the breadth of the claims; (B) the amount of direction provided by the inventor; (C) the existence of working examples, (D) the level of

predictability in the art; and (E) the quantity of experimentation needed to make or used the invention based on the content of the disclosure.

Factor (A) Breadth of the claims:

No guidance is given in the specification for the innumerable possible embodiments encompassed by the claims of said positive electrode active material comprising primary particles of said composite oxide having a twining portion, the composite oxide further contains cobalt element, and the nickel, manganese, and cobalt elements are uniformly dispersed at the atomic level (claim 1), wherein said composite oxide has a layered crystal structure and the arrangement of oxygen atoms is a cubic close-packed structure (claim 2), wherein said composite oxide has a defected or disordered portion in the crystal lattice thereof (claim 3), wherein said composite oxide has a superlattice arrangement of a [sqrt 3 x sqrt 3] R30 when assigned as R3-m (claim 4), wherein said composite oxide has an integrated intensity ratio (003)/(004) of the X-ray diffraction peak when assigned as R3-m which satisfies the equation: (003)/(104)$\leq$ 1.2 (claim 6), wherein said composite oxide has an extra spot or streak substantially in every electron beam diffraction pattern indexed when assigned as R3-m (claim 7), wherein said primary particles have at least one of spherical and rectangular parallelepiped hexahedron shapes (claim 8). The positive active material as recited in the claims encompasses compounds that are not lithium nickel cobalt manganese oxide compounds disclosed in the instant specification. The specification is directed only to

$LiCo_{1/3}Ni_{1/3}Mn_{1/3}O_2$ and does not disclose how to make positive electrode active materials with the properties recited in the claims.

Factor (B) The amount of direction provided by the inventor.

Applicant gives guidance of the production of the positive electrode active material $LiCo_{1/3}Ni_{1/3}Mn_{1/3}O_2$ Applicant also only provides 1 working example that meet the properties of claim 1. Hence, the general teaching and the examples in the specification do not give guidance on how to make positive electrode active materials positive electrode active materials with the properties recited in the claims.

Factor (C) The existence of working examples:

As stated above, applicant's disclosure of 1 working example does not entitle applicant to claim all positive electrode active material containing Li, Co, Ni, and Mn having a twining portion and uniformly dispersed at the atomic level.

MPEP 2164.03 states "[h]owever, in applications directed to inventions in arts where the results are unpredictable, the disclosure of a single species usually does not provide an adequate basis to support generic claims."

Factor (D) The level of predictability in the art:

The properties as claimed in claims 1-4 and 6-8 of the active material can depend on multiple factors, such as in the method by which the particles were made, as well as initial nickel, cobalt, and manganese precursors. Thus, there is a level of

unpredictability in the art with respect to obtaining the claimed properties of the primary particles of the positive electrode active material.

With respect to the relationship of predictability of the art and the enablement requirement, MPEP 2164.03 states:

> "The amount of guidance or direction needed to enable the invention is inversely related to the amount of knowledge in the state of the art as well as the predictability in the art. In re Fisher, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970). The "amount of guidance or direction" refers to that information in the application, as originally filed, that teaches exactly how to make or use the invention. The more that is known in the prior art about the nature of the invention, how to make, and how to use the invention, and the more predictable the art is, the less information needs to be explicitly stated in the specification. In contrast, if little is known in the prior art about the nature of the invention and the art is unpredictable, the specification would need more detail as to how to make and use the invention in order to be enabling. >See, e.g., Chiron Corp. v. Genentech Inc., 363 F.3d 1247, 1254, 70 USPQ2d 1321, 1326 (Fed. Cir. 2004)...The "predictability or lack thereof" in the art refers to the ability of one skilled in the art to extrapolate the disclosed or known results to the claimed invention. If one skilled in the art can readily anticipate the effect of a change within the subject matter to which the claimed invention pertains, then there is predictability in the art. On the other hand, if one skilled in the art cannot readily anticipate the effect of a change within the subject matter to which that claimed invention pertains, then there is lack of predictability in the art. Accordingly, what is known in the art provides evidence as to the question of predictability...However, in applications directed to inventions in arts where the results are unpredictable, the disclosure of a single species usually does not provide an adequate basis to support generic claims.

In re Soll, 97 F.2d 623, 624, 38 USPQ 189, 191 (CCPA 1938). In cases involving unpredictable factors, such as most chemical reactions and physiological activity, more may be required. In re Fisher, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970)[emphasis added]."

Factor (E) the quantity of experimentation needed to make or used the invention based on the content of the disclosure.

This factor has been addressed by factors (A)-(C) above.

Thus, the claims are properly rejected for scope of enablement since the two stages of inquiry as set forth in MPEP section 2164.08 have been fully addressed herein by the Examiner.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what "a [sqrt 3 x sqrt 3] R30 when assigned as R3-m" means.

Applicant notes in the Response that R3-m structure belongs to rhombohedral structures. However, it is unclear what "a [sqrt 3 x sqrt 3] R30 when assigned as R3-m" means. Does it mean that this expression is equivalent to saying that it is a rhombohedral structure?

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-8 and 10-12, and 14 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ohzuku (Layered Lithium Insertion Material of $LiCo_{1/3}Ni_{1/3}Mn_{1/3}O_2$ for Lithium-Ion Batteries, Chemistry Letters 2001, the Chemical Society of Japan, pgs 642-643).

Ohzuku discloses a positive electrode material comprising the formula $LiCo_{1/3}Ni_{1/3}Mn_{1/3}O_2$ (see Abstract).

Ohzuku does not expressly disclose the crystal structure of the above formula as claimed by the Applicants in claims 1-4 and 6-8. However, the Examiner notes that while the prior art does not explicitly teach these properties, these are considered inherent in the prior art barring any differences shown by objective evidence between the positive electrode material disclosed in the prior art and the applicant. As the positive active material taught by the prior art and the applicant are identical within the

scope of claim 10 and Example 1-2 in the Specification, Ohzuku inherently teaches the crystalline properties as claimed by the Applicants.

A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999). The courts have held that claiming of a property or characteristic which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See MPEP 2112 and 2112.01.

When the Examiner has provided a sound bases for believing that the products of the applicant and the prior art are the same, the burden of proof is shifted to the applicant to prove that the product shown in the prior art does not possess the characteristics of the claimed product. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Regarding claim 14, Ohzuku discloses a $Li/LiCo_{1/3}Ni_{1/3}Mn_{1/3}O_2$ cell (see fig. 3). A cell necessarily contains an electrolyte.

The Examiner notes that Ohzuku meets the limitation "uniform dispersion" for the following reason. As Applicant indicated, red indicates high concentration, green represents a low concentration, and yellow represents an intermediate concentration. The Examiner disagrees with the Applicant that the instant invention has uniform dispersion because should this be correct, the micrographs of the instant invention should be all red, all yellow, or all green. The fact that the micrographs of the instant invention possess all three colors indicate that the dispersion is not uniform. The

Examiner notes that the micrograph of the prior art demonstrates "uniform dispersion" because it is mostly green.

Claims 1-8 and 10-12, and 14 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Thakeray (US 2006/0099508).

Thakeray discloses a positive electrode material comprising the formula $LiCo_{1/3}Ni_{1/3}Mn_{1/3}O_2$ (see Abstract).

Thakeray does not expressly disclose the crystal structure of the above formula as claimed by the Applicants in claims 1-4 and 6-8. However, the Examiner notes that while the prior art does not explicitly teach these properties, these are considered inherent in the prior art barring any differences shown by objective evidence between the positive electrode material disclosed in the prior art and the applicant. As the positive active material taught by the prior art and the applicant are identical within the scope of claim 10 and Example 1-2 in the Specification, Thakeray inherently teaches the crystalline properties as claimed by the Applicants.

A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999). The courts have held that claiming of a property or characteristic which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See MPEP 2112 and 2112.01.

When the Examiner has provided a sound bases for believing that the products of the applicant and the prior art are the same, the burden of proof is shifted to the applicant to prove that the product shown in the prior art does not possess the characteristics of the claimed product. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohzuku (Layered Lithium Insertion Material of $LiCo_{1/3}Ni_{1/3}Mn_{1/3}O_2$ for Lithium-Ion Batteries, Chemistry Letters 2001, the Chemical Society of Japan, pgs 642-643) as applied to claim 1 above, and further in view of Miyasaka (US 6416902).

Ohzuku discloses all the elements of claim 1 and are incorporated herein. Ohzuku discloses particles but does not disclose primary particles and secondary particles as claimed in Applicant's claim 9. However, Miyasaka discloses a lithium ion battery comprising a positive electrode with a mean grain size in the range of 1 to 30 um for secondary particles and in the range of 0.1 to 0.5 for primary particles (5:48-57). Thus, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to have primary and secondary particles as taught by Miyasaka for the benefit of having two particle size distribution. Having two particle size distribution will enhance better packing of because smaller particles will be able to occupy void spaces between larger particles.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thakeray (US 2006/0099508) as applied to claim 1 above, and further in view of Miyasaka (US 6416902).

Thakeray discloses all the elements of claim 1 and are incorporated herein. Thakeray discloses particles but does not disclose primary particles and secondary particles as claimed in Applicant's claim 9. However, Miyasaka discloses a lithium ion battery comprising a positive electrode with a mean grain size in the range of 1 to 30 um for secondary particles and in the range of 0.1 to 0.5 for primary particles (5:48-57). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have primary and secondary particles as taught by Miyasaka for the benefit of having two particle size distribution. Having two particle size distribution will enhance better packing of because smaller particles will be able to occupy void spaces between larger particles.

Response to Arguments

Applicant's arguments filed 2/20/2007 have been fully considered but they are not persuasive.

Declaration submitted on 2/20/2007

As Applicant indicated, red indicates high concentration, green represents a low concentration, and yellow represents an intermediate concentration. First, the Examiner disagrees with the Applicant that the instant invention has uniform dispersion because should this be correct, the micrographs should be all red, all yellow, or all green. The fact that the micrographs of the instant invention possess all three colors indicate that the dispersion is not uniform. The Examiner notes that the micrograph of the prior art demonstrates "uniform dispersion" because it is mostly green.

Accordingly, the prior art arguments have not been found persuasive.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ckl

Cynthia Lee

Patent Examiner

Susy Tsang Foster

SUSY TSANG-FOSTER
SUPERVISORY PATENT EXAMINER